DISCUSSION OF THE AMENDMENT

Claims 11-12, 14-18, 20-22, 25-32, 34, and 36-54 are active in the present application. Claims 42-43 and 45-46 are presently withdrawn from prosecution. Claims 13, 19, 23-24, 33 and 35 are canceled claims. Claims 48-54 are new claims. Support for new Claim 48 is found on page 2, line 3. Support for new Claims 49-52 is found in the first paragraph on page 9. Support for new Claims 53 and 54 is found throughout the specification. New Claims 53 and 54 require that the stable material "consist of" SiO_2. This transitional phrase signals a closed claim which excludes the presence of other materials from the stable material recited in the claims. Support for new Claims 53 and 54 is found throughout the specification. For example, the original specification describes the formation of a layer of SiO_2 by chemical vapor deposition. Additionally, the original specification describes the oxidation of a Si substrate. Applicants submit that it is readily recognized that forming SiO_2 by chemical vapor deposition forms a layer that consists of SiO_2 and no other chemical species, not withstanding those impurities which are commonly present in chemical processes. Likewise the oxidation of silicon with oxygen forms SiO_2. Thus, the new claims are supported by the original specification.

No new matter is believed to have been added by this amendment.

REMARKS

Independent Claim 11 is now drawn to a micro heat-transport device. A micro heat-transport device is one that may be used in applications such as electronic devices and micro electromechanical systems (page 1 of the specification). In one embodiment of the invention the micro heat-transport device is used in applications such as computer CPUs, light-emitting devices, or actuators used under thermally severe conditions (see page 5).

The first and second substrates of Claim 11 are at least one of a glass substrate and a silicon substrate. One or more of the glasses and substrates recited in the claims is covered with a stable material that is formed by at least one of nitriding, oxidation, ion implantation, chemical vapor deposition and carbonization.

The Office is of the opinion that Kirshberg (US 2003/006625) in combination with Steele (US 5,562,949) and/or Uchida (US 5,943,543) suggest the invention of the previously presented claims and therefore render the previously presented claims obvious. Applicants note that the inventions of Uchida and Steele are drawn to conventional heat-transport devices. In contrast, the product of independent Claim 11 is a micro heat-transport device and the process of Claim 17 includes forming a micro device. At the outset, Applicants submit that the disclosure of conventional heat transport devices in Uchida and/or Steele is not relevant to the micro heat-transport device presently claimed and thus the rejection should be withdrawn.

As already mentioned, Steele and Uchida may disclose conventionally sized heat transport devices (see the Abstract of Uchida and the Figures of Steele which show a component of the prior art device having dimensions of several inches in length). Because Steele and Uchida are directed to devices and/or technologies that are applied on a macro scale, e.g., by conventional handling and treating techniques, the coated surface components described therein cannot be practically made on a micro scale. For example, Steele discloses coating a surface with a composition that is in the form of a slurry (see the paragraph

bridging columns 2 and 3 of Steele). The coatings of Steele contain particulate material having a particle size of greater than 14 μm. At this scale the coating of Steele would clog the wick of new Claim 52. Moreover, Applicants submit that it is readily recognized that it would not be possible to coat the surfaces of a micro device using the slurry of Steele.

Further with respect to Steele, the present claims require that the stable material is made from one of chemical vapor deposition, ion implantation, nitriding, oxidation and carbonization. The coating of Steele is applied by coating the prior art heat transfer surface with a slurry. This is in no way related to the formation of the stable material of the present claims.

The Office asserted that the method of making the stable material would not matter. Applicants submit this is not correct. In comparison to a technique such as the coating technique of Steele, chemical vapor deposition, ion implantation, oxidation, nitriding and carbonization are substantially different. The process of Steele necessarily contacts and leaves a resin or other binder after the prior art heat transfer surface is contacted with the prior art slurry. See for example column 4, lines 13-21 of Steele:

> The binder is made up of a combination of an adhesive agent and an insolubilizer. The binder provides structural integrity to the coating by binding it together, and good adherence to and uniformity of coverage of the heat transfer surfaces.
>
> The adhesive agent used in the binder actually provides the structural integrity to the coating by binding the coating together and preventing flaking and cracking. This adhesive agent provides structural integrity without adversely affecting the hydrophilic properties of the coating.

The prior art slurry contains a bonder and an inorganic compound (see column 3, lines 58-60):

> A few such inorganic compounds include uncoated silica, calcium silicate particles, and mixtures thereof.

The prior art surface is therefore covered with a coating that is a non-homogeneous mixture of a binder and an inorganic compound.

In contrast, the techniques recited in the present claims are carried out without the use of any secondary material such as a diluent or carrier. The resulting treated surfaces do not include a binder. Techniques such as chemical vapor deposition, ion implantation, oxidation, carbonization and nitriding are chemical techniques that change the chemical form of the exterior layer of the surface that is treated. With the exception of chemical vapor deposition, the processes of the present claims result in a direct chemical change of an existing surface. Steele on the other hand requires the addition of a coating layer in order to provide a different surface.

Therefore, the Office's assertion that the method for making the stable material would not matter is not correct.

Claim 11 now further states that the substrate is one of a glass substrate or a silicon substrate. Present Claims 11 and 13 are thus further distinguished from Uchida. Uchida discloses conventional piping and heating plates, e.g., devices made from metals. While Uchida may disclose oxidizing the prior art surface, this is in relation to a metal surface and not the glass and/or silicon surface of the substrate of the present claims. As explained above for Steele, any disclosure in Uchida which describes the application of a coating layer to the prior art heat transfer surface is not relevant to the claimed micro heat-transport device because while such coating may be acceptable for forming thick and/or irregular layers on conventionally sized devices, it is not appropriate for devices which are structured on a micro scale.

For the reasons above, Applicants submit that Uchida and Steele are not relevant to the claimed invention and their combination with Kirshberg is insufficient to render the claimed invention obvious.

For the reasons discussed above, Applicants submit that the prior art relied on by the Office does not render the presently claimed invention obvious and the claims should be allowed.

REQUEST FOR REJOINDER

After finding allowable subject matter, the Office is requested to rejoin and allow withdrawn Claims 42-43 and 45-46 by expanding the search to include those species of stable material and species of wick elected by Applicants for further prosecution.

Respectfully submitted,

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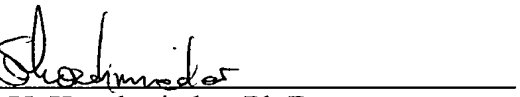

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